

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the present amendments and following discussion, is respectfully requested.

Claims 1-18 and 20 are pending; Claims 1, 3, 4, and 11 are amended; Claim 19 is cancelled; and no claims are newly added herewith. It is respectfully submitted that no new matter is added by this amendment.

In the outstanding Office Action, Claims 1-20 were rejected under 35 U.S.C. § 102(b) as anticipated by Shimizu (U.S. Pat. No. 4,663,644). Claims 13 and 19 were objected to under 37 C.F.R. § 1.75(c).

With regard to the objection to Claims 13 and 19, Claim 19 has been cancelled herewith. Accordingly, it is respectfully requested that this objection be withdrawn.

With respect to the rejection of Claims 1-20 under 35 U.S.C. § 102(b) as unpatentable over Shimizu, that rejection is respectfully traversed.

In the past, an increase in a number of trench gates necessitated an increase in the number of source contacts, which sometimes resulted in shifting during engraving. Additionally the margin between the gate and the source decreased, resulting in a short-circuit. Ultimately, insufficient formation of the barrier metal layer caused current leakage between the drain and the source.<sup>1</sup> To overcome these difficulties, the Applicants developed the claimed invention.

To this end, Claim 1 recites, in part, “a first gate insulating film formed on at least two surfaces of a gate electrode of the first gate electrode group.” Independent Claims 3, 4, and 11 recite analogous features. Through the claimed invention, it is possible to form a channel region on the surface regions of the gate electrodes. As a result, since the number of channel

---

<sup>1</sup> Specification, page 3.

regions may be increased in a given design space, channel density is increased and the device resistance of the MOSFET is improved.

Shimizu relates to a semiconductor device including vertical type MOSFETs.

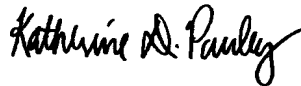
According to Shimizu, an insulating film may be formed on a main surface of the gate electrode. However, Shimizu does not disclose or suggest forming the insulating film on more than one surface of a gate electrode. As a result, Shimizu necessarily fails to disclose or suggest the features of independent Claims 1, 3, 4, and 11.

Thus, as Shimizu does not disclose or suggest the features of independent Claims 1, 3, 4, and 11, it is respectfully requested that the rejection of Claims 1-18 and 20 be withdrawn.

Consequently, in view of the foregoing discussion and present amendments, it is respectfully submitted that this application is in condition for allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.



Eckhard H. Kuesters  
Attorney of Record  
Registration No. 28,870

Katherine D. Pauley  
Registration No. 50,607

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 06/04)

JDM:KDP\la  
I:\ATTY\KDP\24'S\240349US\240349US AM 5-11-05.DOC